

Amendments to Claims

The following amendment will replace the claim set taken from International Application PCT/GB2004/000311. Please cancel all the currently pending claims and add the following claims:

IN THE CLAIMS:

58. A method for making an image of an object comprising including depth information comprising :

illuminating the object with a periodic pattern of light, whereby the pattern is in focus in a focal plane and progressively defocused as distance from the focal plane changes;
capturing image data from the illuminated object;
analysing the extent of defocussing of the pattern in the captured image data;
extracting depth information based upon the extent of the defocusing; and
displaying an image of the object without the pattern and with the depth information.

59. A method according to claim 58, in which the image is a mask image.

60. A method according to claim 59, in which the captured image data are captured in a single image.

61. A method according to claim 58, in which the image is an angular-composite image.

62. A method according to claim 61 wherein capturing image data from the illuminated object comprises capturing image data in at least two mask images from differing angular orientations about a single axis orthogonal to a line between the object and the illuminating source.

63. A method according to claim 58, wherein capturing image data comprises capturing 3D image data.

64. A method according to claim 63, wherein capturing 3D image data comprises capturing the 3D image data in at least three mask images from differing angular orientation about the

object in at least two axes orthogonal to a line joining the object and the illuminating source.

65. A method according to claim 58 wherein the object does not intersect the focal plane.
66. A method according to claim 58 wherein illuminating the object with a periodic pattern of light comprises illuminating with alternating bright and dark lines.
67. A method according to claim 58 wherein illuminating the object with a periodic pattern of light comprises illuminating with a grating.
68. A method according to claim 67, in which the grating is of equally spaced light and dark parallel lines.
69. A method according to claim 58 analysing the extent of defocussing of the pattern comprises calculating the extent of defocussing based on the modulation contrast of the pattern.
70. A method according to claim 59 wherein the mask image data comprise pixel image data.
71. A method according to claim 70, wherein analysing the extent of defocussing of the pattern comprises analyzing the pixel image data on a pixel- by-pixel basis.
72. A method according to claim 58, wherein capturing image data comprises capturing the image data in colour.
73. A method according to claim 58 wherein displaying an image of the object comprises formatting the image data for display using a preferred display system.
74. An Imaging apparatus for making an image of an object comprising depth information, comprising:
an illuminating apparatus adapted to illuminate the object with a periodic pattern of light;
the illuminating apparatus configured such that the periodic pattern is in focus in a focal plane and defocused progressively as distance from the focal plane changes;

an image data capturing means adapted to capture image data from the thus illuminated object;

data analysis means adapted to analyse captured image data and to extract depth information based on the extent of defocussing of the pattern; and

image display means for displaying an image of the object without the pattern and with depth information.

75. Apparatus according to claim 74, wherein the illuminating apparatus comprises a light source, focussing means and a grating.
76. Apparatus according to claim 75, further comprising a support, the support adapted to support the illumination apparatus and the object in relationship to one another such that the object does not intersect the focal plane.
77. Apparatus according to claim 76, wherein the support permits relative adjustment between the object and the illuminating apparatus.
78. Apparatus according to claim 76 wherein the support comprises a turntable.
79. Apparatus according to claim 75, further comprising means adapted to alter the orientation of the grating..
80. Apparatus according to claim 74 wherein the image display means comprises a video screen driven by software capable of simulating and manipulating a 3D image.